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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/897,003	07/02/2001	Douglas E. Smith	1082-010	1140

7590 05/03/2002

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EXAMINER

MARTIR, LILYBETT

ART UNIT	PAPER NUMBER
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2855

DATE MAILED: 05/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/897,003

Applicant(s)

SMITH ET AL.

Examiner

Lilybett Martir

Art Unit

2855

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 25-43 is/are rejected.
- 7) ☒ Claim(s) 12-24 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Drawings

New formal drawings are required in this application because the thickness of the lines used in Figures 1-15 is too thin therefore making it difficult to appreciate the details of the structures that compose the claimed apparatus, and a plurality of the numbers disclosed in the specification to define elements in the drawings are not present in the drawings. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 2855

Claims 1-4, 36 and 39-43 are rejected under 35 U.S.C. 102(b) as being anticipated by Maw et al. (Pat. 5,783,751). Maw et al teaches the claimed invention, including:

- A pin member body as in element 10 disposed about a pin member axis, the pin member comprising a bending portion as in element 12, a sensing device as in elements 20a and 20b positioned within the bending portion for sensing a bending strain in the bending portion exclusive of a net axial strain, and for outputting a sensor measurement signal representative of the bending strain (Col. 3, lines 11-12); and a sensor measurement signal output device as in elements 17, 61, and 62 for outputting the sensor measurement signal from the sensor device; as in claim 1.
- The sensing devices as in elements 20a and 20b inherently sensing components of the bending strain in the bending portion along the x axis and a y axis, the x axis and the y axis being orthogonal to the pin member axis and to each other (note the position of the gauges in Figure 2), as in claim 2.
- The pin member being a bolt as noted in Figure 1, as in claim 3.
- The pin member body as in element 10 having a cylindrical shape about the pin member axis as noted in Figure 1, as in claim 4.
- A pin member body as in element 10 disposed about a pin member axis, the pin member comprising a bending portion as in element 12, a

sensing device as in elements 20a and 20b positioned within the bending portion for sensing a bending strain in the bending portion exclusive of a net axial strain, and for outputting a sensor measurement signal representative of the bending strain (Col. 3, lines 11-12); and a sensor measurement signal output device as in elements 17, 61, and 62 for outputting the sensor measurement signal from the sensor device having a data receiving device operatively coupled to the sensor measurement signal output device for receiving the sensor output signal as in element 62 as noted in Figure 3; as in claim 36.

- The data receiving means comprising a data processor as in element 62 (Col. 2, lines 49-52), as in claim 39.
- The data receiving means comprising a data display as in element 62 (Col. 2, lines 49-52), as in claim 40.
- Regarding claims 41-43, said claims exist as an essential constituent of the claimed invention, and therefore are said to be inherently disclosed in the teachings of Maw et al.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2855

Claims 5-11 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maw et al. (Pat. 5,783,751) in view of Malicki (Pat. 4,553,124). Maw et al. Teaches the claimed invention, including:

- The pin member having a head as in element 11, and a bending portion as in element 12, as in claim 5.
- Sensor elements as in elements 20a and 20b for measuring the bending strain, as in claim 6.
- Axial sensors as in elements 20a and 20b for sensing strain in a pin member axial direction corresponding to the pin member axis, as in claims 7,9 and 11.
- The pin member body 10 comprising a shank including a shank perimeter lying in a plane orthogonal to the pin member axis as noted in Figure 1, as in claim 8,10 and 11.
- Bridge assemblies as in elements 30, as in claim 25.

But he does not disclose:

- The bending portion being adjacent to the head, as in claim 5.
- The sensor elements being positioned to measure the bending strain in the x-axis and the y-axis, as in claim 6-7 and 9.
- The x-axis and y-axis sensors comprising a tangential sensor for sensing strain in a tangential direction tangential to the shank perimeter, as in claims 8,10 and 11.

Art Unit: 2855

- Said bridge assemblies having an axial stress measurement configuration and a bending stress measurement configuration, as in claim 25.

Malicki teaches a bolt with a strain gauge transducer assembly having a bending portion adjacent to the head of the pin member as noted in Figures 2 and 3, with sensor elements C1 and T1 positioned to measure the bending strain in the x-axis and the y-axis as noted in Figure 4, with bridge assemblies having an axial stress measurement configuration and a bending stress measurement configuration as noted in Figures 6-8 (Col. 5-6, lines 64-13), and a tangential sensor for sensing strain as noted in Figures 2-5.

Since it has been held that rearranging parts of an invention involves only routine skill in the art; *In re Japikse*, 86 USPQ70; it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the force sensor of Maw et al. using the teachings of the transducer assembly of Malicki by providing said sensor with a strain gauge assembly having a bending portion adjacent to the head with sensors arranged in specific configurations to measure bending strain in specific locations for the purpose of experimentally arranging the sensing devices in specific locations that would inherently allow for strain measurements to be made on said specific portion of the pin member therefore making said sensing device more versatile.

Art Unit: 2855

Claims 26-35 and 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maw et al. further in view of Dillon et al. Maw et al. Teaches the claimed invention, including:

- A pin member comprising a head as in element 11, as in claim 28.
- A pin member head 11 including an external surface and a notch 15, as in claim 29.
- The pin member having a head as in element 11 with a head cavity as in element 15, as in claim 30.
- Bridge means as in element 30, as in claims 33 and 34.
- A pin member body as in element 10 disposed about a pin member axis, the pin member body comprising a bending portion as in element 20; a sensing device as in elements 20a and 20b positioned on the pin member body; and a sensor signal output device as in elements 17,61 and 62, as in claim 35.

But he does not disclose:

- A switching device operatively coupled to the sensing device, as in claims 26, 32-35, and 37.
- Said switchin device being a solid state switching circuit, as in claim 27.
- The switching device being positioned at the pin member head, as in claim 28.
- The switching device being mounted to the external surface, as in claim 29.

Art Unit: 2855

- The switching device being positioned at the pin member head cavity, as in claim 30.
- The switching device comprising a periodic switching signal source for providing a periodic switching signal, as in claim 31.
- A plurality of the instrumented pin members, as in claim 38.

Dillon et al. teaches a load cell with a rocker pin that comprises a switching device as in element 96 that is operatively coupled to the sensing device as noted in Figure 2.

Since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art.; *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8; it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the force sensor of Maw et al. by providing it with a plurality of pin members instead of one pin member for the purpose of providing the means to make a plurality of strain measurements at different positions therefore making said force sensing system more reliable and accurate. And since the selection of a well known type of switching device is merely design choice, it would also have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the force sensor of Maw et al. using the teachings of the load cell device of Dillon et al. by providing said force sensing system with a switching device such as a solid state switching device that is operatively connected to said sensing device for the purpose of being able to switch between signals from the plurality of strain gauges located at the force sensing device therefore increasing the efficiency of the circuit

Art Unit: 2855

means allowing for just one circuit arrangement to do all the necessary data processing instead of a plurality of them.

Allowable Subject Matter

Claim s 12-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Citation of Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art considered pertinent during examination of the examined application is:


- Shan (Pat. 5,728,0044) Sensor device for spatial imaging of endoscopes.
- Hatamura (Pat. 4,576,053) Load detector.
- Boland (Pat. 4,576,158) Method for determining the stability of an orthopedic device composed of an external fixation bar during setting of bone fractures.
- Wurst et al. (Pat. 5,639,487) Mold core-pin deflection transducer.
- Wilhem (Pat. 4,429,579) Tie rod tension sensor.


Art Unit: 2855


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lilybett Martir whose telephone number is (703)305-6900. The examiner can normally be reached on 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Fuller can be reached on (703)308-0079. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3432 for regular communications and (703)305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.


Lilybett Martir
Examiner
Art Unit 2855


April 24, 2002


Benjamin R. Fuller
Supervisory Patent Examiner
Technology Center 2800